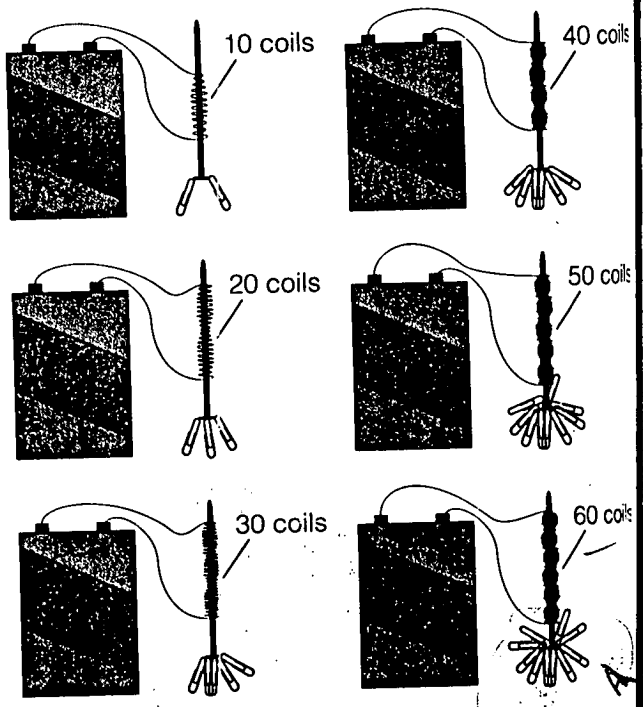
Skills for Solving Problems

Using Diagrams and Line Graphs

Problem: How does the number of coils of insulated wire affect the strength of an electromagnet?

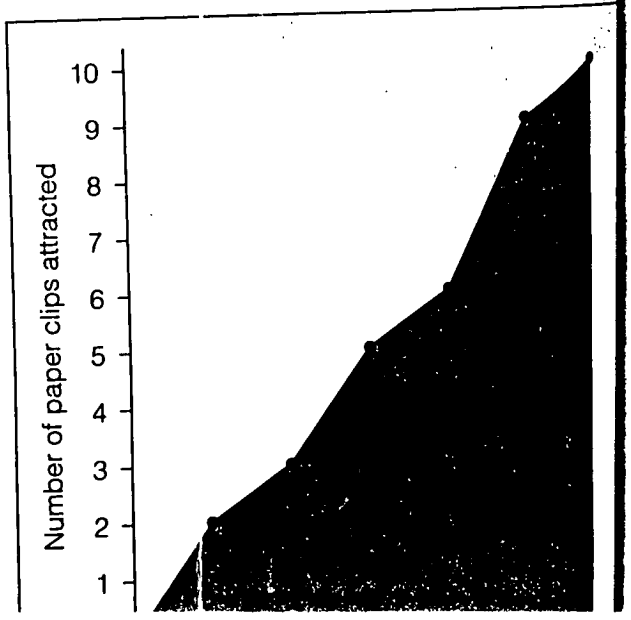
Part A. Using a Diagram to Collect Information

1. The diagrams show how a battery, insulated copper wire, and a steel nail make an electromagnet. You can measure the strength of the electromagnet by how many paper clips the nail picks up. In the diagram, how many paper clips are picked up by the electromagnet with 10 coils?
2. How many paper clips are picked up by the electromagnet with 20 coils? 30 coils? 40 coils? 50 coils? 60 coils?



Part B. Using a Line Graph to Organize and Interpret Information

3. The line graph contains the information you collected about how the number of coils of insulated wire affected the strength of the electromagnet. What do the lines on the left side of the graph stand for? What do the lines at the bottom of the graph stand for?

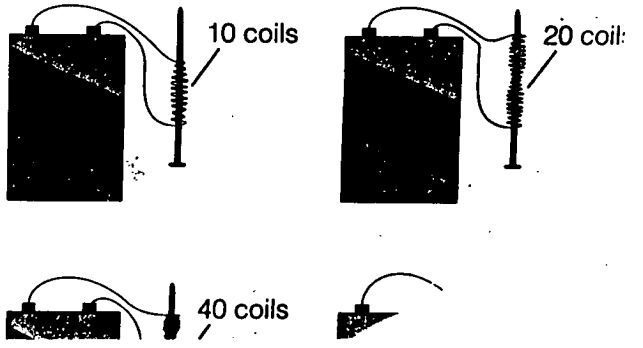


4. Find the line on the bottom of the graph that stands for 10 coils. Now find the dot above this line. What does the line across from this dot stand for? The graph shows that an electromagnet with 10 coils attracts 2 paper clips.

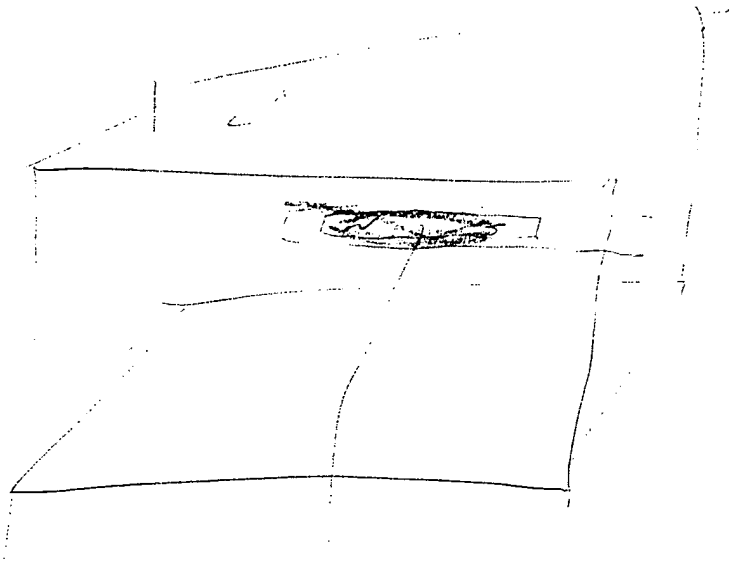
Part C. Using Diagrams and Line Graphs

Problem: How does the number of coils of uninsulated wire affect the strength of an electromagnet?

6. Use the diagrams below to collect the information you need to solve the problem. Make a line graph similar to the one in Part B to organize your information.
7. Look at your line graph. What number of coils attracted the most paper clips? How does the number of coils of uninsulated wire affect the strength of an electromagnet?



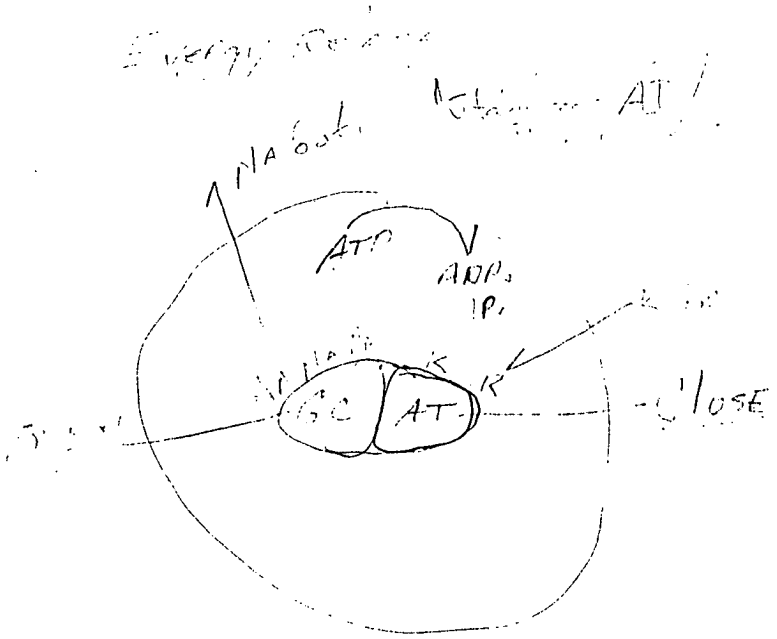
magnet material may be added.

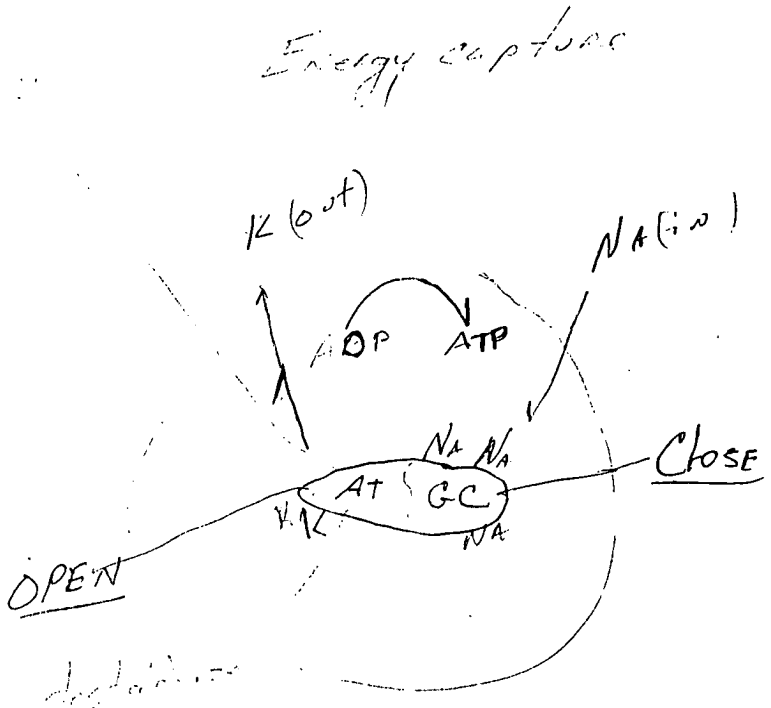


Bar magnet (spacer)

upon shaking box the iron filings become distributed evenly throughout the field. Inserting bar magnet shows 3 dimentional bio-electro magnet field.

The filings depict EMF and the controls of bioelectromagnetic field within the biological cell.



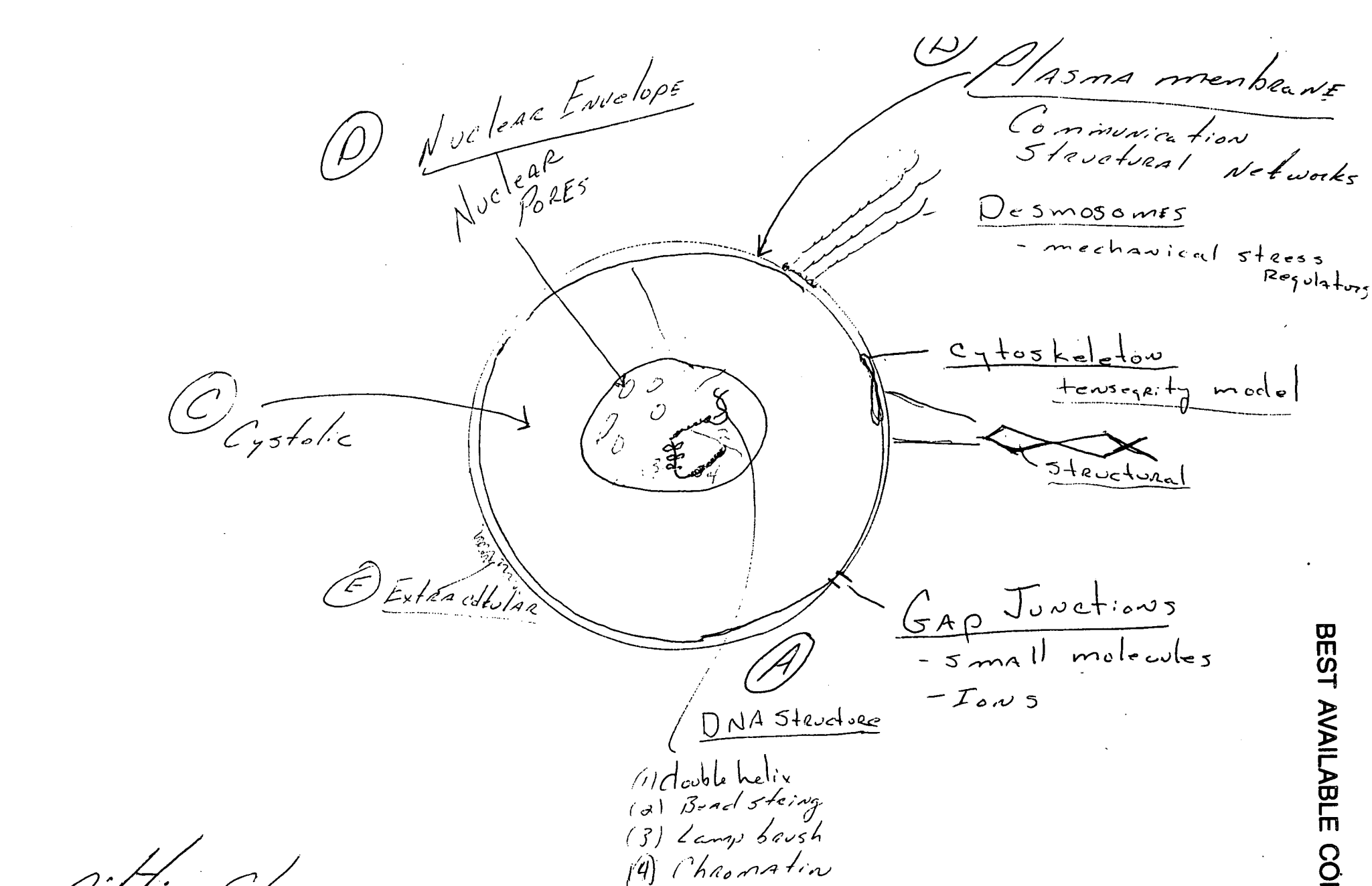


Energy capture

GC
OPEN

Energy coupling

- Flexing capacitor



p.H. Change

(A) Nuclear DNA

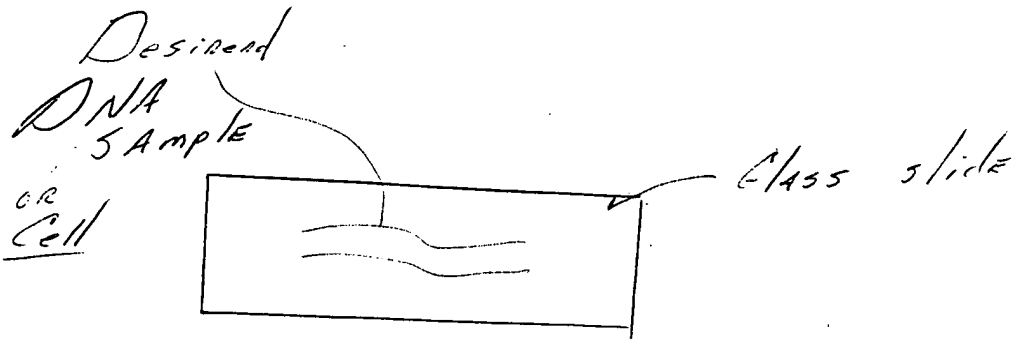
(B) Plasma membrane

(C) Cystol

(D) Nuclear Envelope

(E) Extracellular Environment

(DOC12) DNA - Genomic Circuits



Can be fixed to the slide, held to slide by electrical current, magnetic current, sound frequency. To evaluate the electric components, structure, calculated transition.